

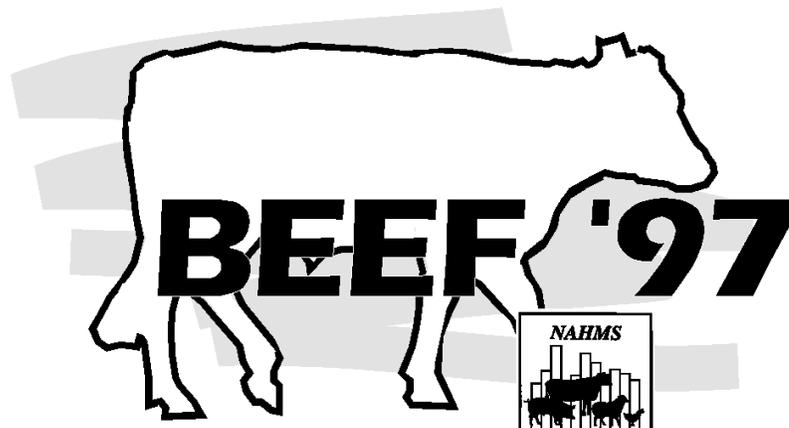
United States  
Department  
of Agriculture

Animal and  
Plant Health  
Inspection  
Service

**Veterinary  
Services**

---

# **Part II: Reference of 1997 Beef Cow-Calf Health & Health Management Practices**



**National Animal Health Monitoring System**

---

**July 1997**

## **Acknowledgements**

This report has been prepared from material received and analyzed by the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) during a nationwide study of management and health on cow-calf operations.

The Beef '97 study was a cooperative effort between State and Federal agricultural statisticians, animal health officials, university researchers, and extension personnel. We want to thank the National Agricultural Statistics Service (NASS) enumerators and State and Federal Veterinary Medical Officers (VMO's) and Animal Health Technician's (AHT's) who visited the operations and collected the data for their hard work and dedication to the National Animal Health Monitoring System (NAHMS).

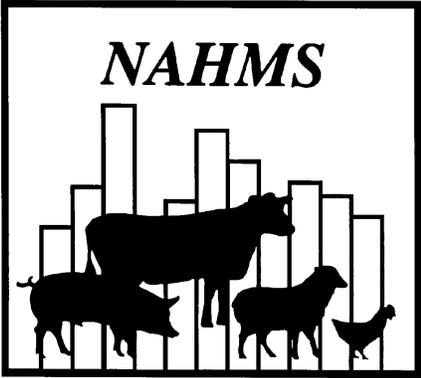
The roles of the producer, Area Veterinarian in Charge (AVIC), NAHMS Coordinator, VMO, AHT, and NASS enumerator were critical in providing quality data for Beef '97 reports. Thanks also to the staff at the Centers for Epidemiology and Animal Health (CEAH) for their efforts in generating timely reports from Beef '97 data. All participants are to be commended for their efforts, particularly the producers whose voluntary efforts made the study possible.

---

Dr. Nora Wineland, NAHMS Program Leader

# Table of Contents

Introduction . . . . .	1
Terms Used in This Report . . . . .	2
Section I: Population Estimates . . . . .	3
A. Health and Health Management . . . . .	3
1. Veterinarian consultation . . . . .	3
2. Deworming . . . . .	4
3. Operator-given injections . . . . .	5
4. Veterinarian-given injections . . . . .	9
5. Calf death loss . . . . .	13
6. Calf morbidity . . . . .	15
7. Cattle death loss . . . . .	17
8. Breeding female morbidity . . . . .	18
B. Biosecurity . . . . .	20
1. Animals on operation . . . . .	20
2. Contact with other animals . . . . .	22
3. Animals brought on . . . . .	23
C. Nutrition Management . . . . .	29
1. Source of nutritional information . . . . .	29
2. Use of calculated balanced rations . . . . .	30
3. Laboratory analysis of feed . . . . .	31
4. Mineral deficiency . . . . .	32
5. Implanting practices . . . . .	33
Section II: Sample Profile . . . . .	37
A. Responding operations . . . . .	37
Section III: U.S. Inventory of Beef Cows and Number of Operations Estimates . . . . .	38





# Terms Used in This Report

**Beef cow:** Female that has calved at least once.

**Beef heifer:** Female not yet calved.

**Breeding cattle:** weaned replacement heifers, cows, and bulls.

**Herd size:** Size groupings based on number of beef cows on hand January 1, 1997.

**N/A:** Not applicable

**Median:** The middle value above and below which lie an equal number of values.

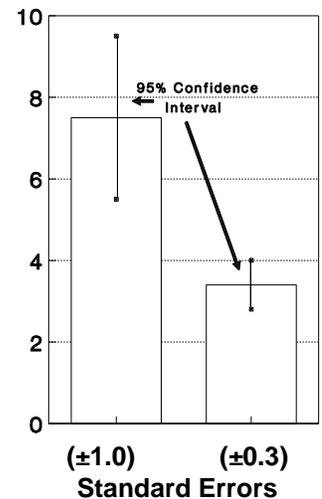
**Mode:** The value occurring most frequently in a series of observations.

**Operation average:** A single value for each operation is summed over all operations reporting divided by the number of operations reporting.

**Perceived cause:** (of illness or death): Causes of illnesses or deaths derived from observations of clinical signs reported by participating producers and not necessarily substantiated by a veterinarian or laboratory.

**Population estimates:** Averages and proportions weighted to represent the population. For this report, the reference population was all cow-calf operations in the 23 selected States. Most of the estimates in this report are provided with a measure of variability called the *standard error* and denoted by ( $\pm$ ). Chances are 95 out of 100 that the interval created by the estimate plus or minus two standard errors will contain the true population value. In the example at right, an estimate of 7.5 with a standard error of  $\pm 1.0$  results in a range of 5.5 to 9.5 (two times the standard error above and below the estimate). The second estimate of 3.4 shows a standard error of  $\pm 0.3$  and results in a range of 2.8 and 4.0. Most estimates in this report are rounded to the nearest tenth.

**Examples of 95% Confidence Intervals**



#999a

**Regions:**

**West:** California, Colorado, Montana, New Mexico, Oregon, and Wyoming.

**Northcentral:** Kansas, Nebraska, North Dakota, and South Dakota.

**Southcentral:** Oklahoma and Texas.

**Central:** Arkansas, Illinois, Iowa, and Missouri.

**Southeast:** Alabama, Florida, Georgia, Kentucky, Mississippi, Tennessee, and Virginia.

**Sample profile:** Information that describes characteristics of the operations from which Beef '97 data were collected.

## Section I: Population Estimates

### A. Health and Health Management

1. Veterinarian consultation

a. Percent of operations that consulted a veterinarian in 1996 by reason and herd size:

Reason	Percent Operations									
	Less Than 50		50-99		100 -299		300 or More		All Ops.	
	Standard Error	Standard Error	Standard Error	Standard Error	Standard Error	Standard Error	Standard Error	Standard Error	Standard Error	Standard Error
Disease diagnosis or treatment	35.8	(±2.4)	55.9	(±2.8)	62.9	(±3.0)	73.7	(±3.9)	42.0	(±1.9)
Disease prevention	32.0	(±2.4)	54.4	(±2.7)	64.7	(±2.8)	71.8	(±3.9)	39.1	(±1.8)
Information on nutrition	13.3	(±1.7)	19.2	(±1.9)	26.7	(±2.4)	24.2	(±3.5)	15.6	(±1.3)
Information on production management practices	11.3	(±1.9)	14.7	(±1.7)	18.6	(±2.0)	21.0	(±3.4)	12.7	(±1.4)
Production or financial analysis	3.0	(±1.0)	3.7	(±0.8)	5.9	(±1.3)	6.5	(±2.2)	3.5	(±0.8)
Any of the above	48.6	(±2.6)	71.6	(±2.4)	79.1	(±2.5)	83.4	(±3.5)	55.5	(±2.0)

The veterinarian is a key information resource for cow-calf producers (*Part 1: Reference of 1997 Beef Cow-Calf Management Practices*. June 1997. USDA:APHIS:VS, Fort Collins, Colorado, page 4.) The veterinarian may provide many services to operations such as diagnosis and care of sick animals, disease prevention, consultation on production, and financial analyses. Over half (55.5 percent) of producers used the services of a veterinarian in 1996.

Veterinarians were most commonly used for disease diagnosis and treatment (42.0 percent of operations), however, 39.1 percent of producers consulted a veterinarian for disease prevention information. Relatively few producers sought the advice of a veterinarian for help with production management practices or production or financial analyses (12.7 percent and 3.5 percent of producers, respectively). There were differences in the use of veterinary services by herd size, both in terms of overall use and also what services the veterinarians were being asked to provide. There was more overall use of veterinary services in larger operations (83.4 percent) compared to the smallest operations (48.6 percent). Larger operations were approximately twice as likely to use each of the individual services of the veterinarian compared to the smallest operations.

2. Deworming

a. Percent of operations that dewormed cattle in 1996 by herd size:

		<u>Percent Operations</u>		<u>Number Cows</u>					
<u>Less Than 50</u>	<u>Standard Error</u>	<u>50-99</u>	<u>Standard Error</u>	<u>100 -299</u>	<u>Standard Error</u>	<u>300 or More</u>	<u>Standard Error</u>	<u>All Ops.</u>	<u>Standard Error</u>
71.6	(±2.3)	76.1	(±2.2)	76.3	(±2.6)	78.2	(±3.5)	72.8	(±1.8)

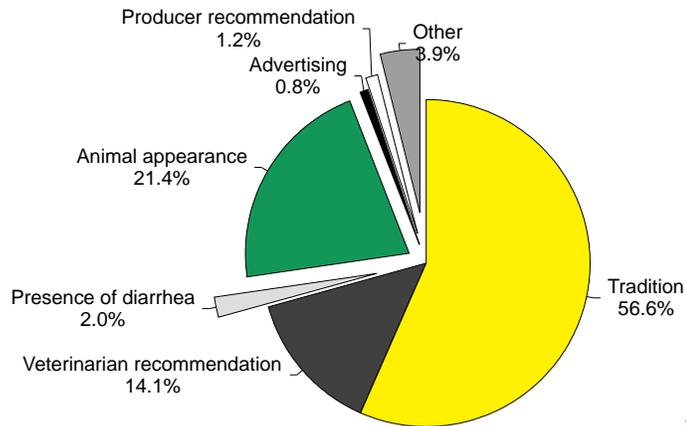
Nearly three-quarters (72.8 percent) of all producers indicated that they dewormed some cattle in 1996. This level of use was relatively consistent across all herd sizes. Since herd size is strongly related to region, it is unlikely that there are strong regional differences in use of this management practice.

b. Of operations that dewormed cattle, percent of operations by most important factor for deciding when to deworm:

<u>Factor</u>	<u>Percent Operations</u>	<u>Standard Error</u>
Tradition	56.6	(±2.3)
Veterinarian recommendation	14.1	(±1.5)
Presence of diarrhea	2.0	(±0.8)
Animal appearance	21.4	(±2.0)
Advertising	0.8	(±0.5)
Recommendation of another producer	1.2	(±0.6)
Other	<u>3.9</u>	(±1.1)
Total	100.0	

The majority of producers that dewormed cattle in 1996 did so based on tradition rather than some sort of an assessment of animal condition or laboratory testing. The second most frequently cited criterion for deworming was animal appearance (21.4 percent). Seemingly producers did not make their decisions based on advertising (only 0.8 percent).

**Percent of Operations by Most Important Factor in Deciding When to Deworm Cattle**



#3487

3. Operator-given injections

a. Percent of operations (and percent of cows on these operations) where the operator or any unpaid or hired workers gave injections to any beef cattle in 1996 by herd size:

Percent	Less Than 50		Standard Error		50-99		Standard Error		100-299		Standard Error		300 or More		Standard Error		All Ops.		Standard Error		
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	
Operations	60.0	(±2.6)	83.4	(±1.8)	89.3	(±2.4)	99.6	(±0.3)	66.9	(±2.0)											
Cows	66.8	(±2.1)	83.5	(±1.7)	90.8	(±2.2)	99.8	(±0.2)	84.3	(±1.0)											

Since the first National Beef Quality Audit, a great deal of concern has been focused on injection site lesions. These data indicate that virtually all large operations (99.6 percent) gave some injections to their cattle. Only 60.0 percent of the smallest operations (those with fewer than 50 cows) indicated that any injections were given to their cattle by on-farm labor in 1996.

b. For operations where the operator or any unpaid or hired worker gave injections to any beef cattle in 1996, percent of operations that gave one or more injections by route and herd size:

Route	Less Than 50		Standard Error		50-99		Standard Error		100-299		Standard Error		300 or More		Standard Error		All Ops.		Standard Error		
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	
Intramuscular	69.7	(±3.3)	73.0	(±3.4)	75.0	(±3.0)	81.7	(±3.2)	71.3	(±2.3)											
Subcutaneous	64.0	(±2.9)	70.7	(±2.6)	80.0	(±2.2)	86.1	(±2.9)	67.8	(±2.0)											
Other	0.2	(±0.1)	0.3	(±0.1)	1.0	(±0.5)	0.0	(±0.0)	0.3	(±0.1)											

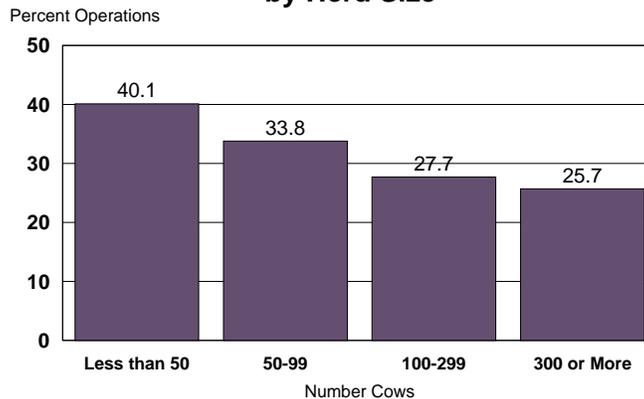
The greatest concern regarding injections is lesions caused by intramuscular injections. Most operations (71.3 percent) gave some injections to beef cattle by the intramuscular route. A higher proportion of large operations (81.7 percent) used some intramuscular injections compared to the smallest operations (69.7 percent). This difference may reflect different injection techniques for similar products or use of different products (with different approved routes of administration). This study did not provide insights into which of these is the case. In addition, data from this study did not differentiate between injections given to breeding cattle and those given to calves. Injection lesions in breeding cattle may be less of a concern since much of the beef from these animals becomes ground product.

c. For operations where the operator or any unpaid or hired workers gave injections to any beef cattle in 1996, percent of operations by *main route* (largest percent of injections) and herd size:

Route	<u>Percent Operations</u>									
	Less Than 50		Standard Error		Standard Error		Standard Error		All Ops.	Standard Error
Intramuscular	40.1	(±3.0)	33.8	(±2.8)	27.7	(±2.5)	25.7	(±3.7)	37.0	(±2.0)
Subcutaneous	38.1	(±3.3)	38.6	(±3.3)	41.0	(±3.0)	43.1	(±4.3)	38.7	(±2.3)
Other	0.0	(±0.0)	0.1	(±0.1)	0.2	(±0.2)	0.0	(±0.0)	0.1	(±0.0)
Tied	<u>21.8</u>	(±2.5)	<u>27.5</u>	(±2.6)	<u>31.1</u>	(±2.5)	<u>31.2</u>	(±4.1)	<u>24.2</u>	(±1.8)
Total	100.0		100.0		100.0		100.0		100.0	

From these data, it appears that although more larger operations used some intramuscular injections, fewer of the largest operations (25.7 percent) used the intramuscular route as the primary route of injection compared to the smallest operations (40.1 percent). The subcutaneous route of administration was the predominant route for approximately two-fifths of all operations regardless of size.

**Percent of Operations\* Where the Main Route for Operator-Given Injections Was Intramuscular by Herd Size**



#3488

\*For operations where the operator or any unpaid or hired workers gave injections to any beef cattle in 1996.

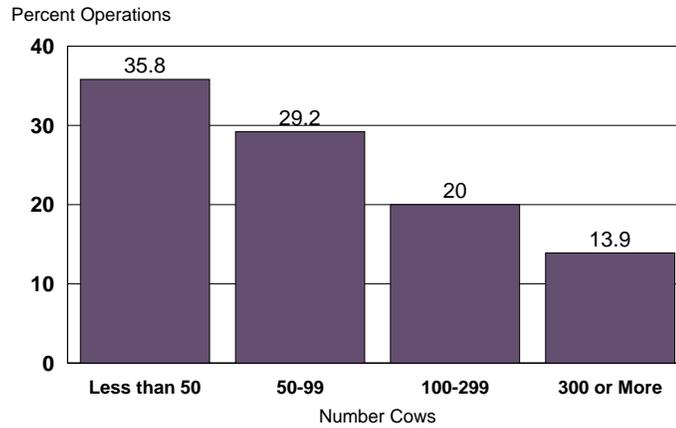
d. For operations where the operator or any unpaid or hired workers gave injections to any beef cattle in 1996, operation average percent of injections by route and herd size:

Route	<u>Operation Average Percent</u>									
	Less Than 50		Standard Error		Standard Error		Standard Error		All Ops.	Standard Error
Intramuscular	51.3	(±2.8)	48.6	(±2.7)	44.1	(±2.2)	43.3	(±2.7)	49.7	(±1.9)
Subcutaneous	48.7	(±2.8)	51.3	(±2.7)	55.8	(±2.3)	56.7	(±2.7)	50.2	(±1.9)
Other	<u>0.0</u>	(±0.0)	<u>0.1</u>	(±0.1)	<u>0.1</u>	(±0.1)	<u>0.0</u>	(±0.0)	<u>0.1</u>	(±0.0)
Total	100.0		100.0		100.0		100.0		100.0	

e. For operations where the operator or any unpaid or hired workers gave injections to any beef cattle in 1996, percent of operations using only one injection route or a mixture of injection routes by herd size:

Route	Percent Operations								All Ops.	Standard Error
	Less Than 50		Standard Error		Standard Error		Standard Error			
All intramuscular	35.8	(±2.9)	29.2	(±2.6)	20.0	(±2.2)	13.9	(±2.9)	32.0	(±2.0)
All subcutaneous	30.3	(±3.3)	26.9	(±3.4)	24.9	(±3.0)	18.3	(±3.2)	28.7	(±2.3)
All other	0.0	(±0.0)	0.0	(±0.0)	0.1	(±0.1)	0.0	(±0.0)	0.0	(±0.0)
Mixture of the above	33.9	(±3.0)	43.9	(±3.1)	55.0	(±3.0)	67.8	(±3.9)	39.3	(±2.1)
Total	100.0		100.0		100.0		100.0		100.0	

**Percent of Operations\* Where the Operator Gave Only Intramuscular Injections by Herd Size**



\*For operations where the operator or any unpaid or hired workers gave injections to any beef cattle in 1996.

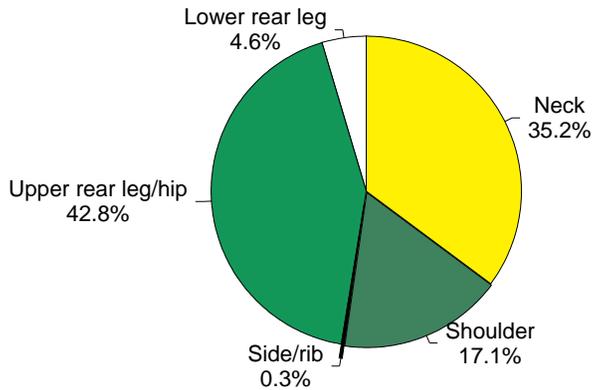
#3489

f. For operations where the operator or any unpaid or hired workers gave intramuscular or subcutaneous injections to any beef cattle in 1996, percent of operations by usual location of injections within each route:

<u>Location</u>	<u>Percent Operations</u>			
	<u>Route</u>		<u>Route</u>	
	<u>Intramuscular</u>	<u>Standard Error</u>	<u>Subcutaneous</u>	<u>Standard Error</u>
Neck	35.2	(±2.1)	78.1	(±2.3)
Shoulder	17.1	(±2.4)	13.3	(±2.1)
Side/rib	0.3	(±0.1)	2.3	(±0.5)
Upper rear leg/hip	42.8	(±2.5)	4.6	(±1.0)
Lower rear leg	<u>4.6</u>	(±1.0)	<u>1.7</u>	(±0.9)
Total	100.0		100.0	

Concerning intramuscular injections, the largest impact on beef quality occurs when irritating products are delivered intramuscularly in the higher value portions of the carcass (e.g., the rear leg compared to the neck). These data indicate that the usual location for intramuscular injections made by on-farm labor was the upper rear leg (42.8 percent). However, for 35.2 percent of operations, the usual location of intramuscular injections was the neck. Producers that cited the shoulder location for intramuscular injection were probably referring to the region directly ahead of the bony shoulder. These locations can be considered the lower neck region bringing the total percentage of operations where the neck or shoulder was the usual site for injections to 52.3 percent.

**Percent of Operations by Usual Location of Operator-Given Intramuscular Injections**



\*For operations where the operator or any unpaid or hired workers gave intramuscular injections to any beef cattle in 1996.

#3490

4. Veterinarian-given injections.

a. Percent of operations (and percent of cows on these operations) where a veterinarian gave injections to any beef cattle in 1996 by herd size:

Percent	Percent Number Cows									
	Less Than 50	Standard Error	50-99	Standard Error	100-299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Operations	31.3	(±2.4)	48.9	(±2.8)	50.6	(±2.9)	61.2	(±4.1)	36.2	(±1.8)
Cows	34.0	(±2.1)	49.4	(±2.7)	51.8	(±3.4)	62.8	(±4.4)	48.4	(±1.6)

In some cases the veterinarian was seen as a role model for animal health care activities. How the producer perceives the veterinarian’s injection delivery or methods of handling cattle may influence how the producer performs similar tasks. The producer’s perception of the veterinarian’s preference may not match reality; however producers’ perceptions impact their judgment. The veterinarian’s preference may also be impacted by facility design and concerns for safety. This study reports on the producer recollection of the route and sites used for veterinarian-delivered injections. Methods for these injections (route and location) may differ from the veterinarian’s preferred route and location.

Approximately one-third (36.2 percent) of operations had a veterinarian deliver some injections to their cattle. The percentage was higher for the largest operations (61.2 percent) compared to the smallest operations (31.3 percent).

b. For operations where a veterinarian gave injections to any beef cattle in 1996, percent of operations by route and herd size:

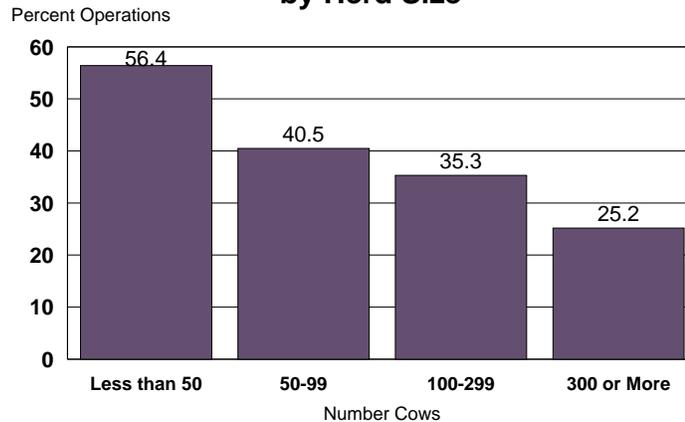
Route	Percent Operations Number Cows									
	Less Than 50	Standard Error	50-99	Standard Error	100-299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Intramuscular	76.8	(±3.8)	68.8	(±3.8)	62.3	(±4.0)	52.4	(±5.9)	72.5	(±2.6)
Subcutaneous	46.1	(±4.5)	63.9	(±3.5)	69.0	(±3.3)	82.4	(±4.4)	53.7	(±3.1)
Other	1.3	(±0.7)	0.7	(±0.4)	1.1	(±0.5)	0.0	(±0.0)	1.1	(±0.5)

c. For operations where a veterinarian gave injections to any beef cattle in 1996, percent of operations by *main route* (largest percent of injections) and herd size:

Route	Percent Operations Number Cows									
	Less Than 50	Standard Error	50-99	Standard Error	100-299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Intramuscular	56.4	(±4.5)	40.5	(±3.7)	35.3	(±3.6)	25.2	(±5.0)	49.6	(±3.1)
Subcutaneous	24.0	(±3.8)	38.3	(±3.8)	44.5	(±4.0)	53.9	(±5.8)	30.4	(±2.6)
Other	0.6	(±0.4)	0.2	(±0.1)	0.6	(±0.3)	0.0	(±0.0)	0.5	(±0.2)
Tied	<u>19.0</u>	(±3.6)	<u>21.0</u>	(±3.1)	<u>19.6</u>	(±3.0)	<u>20.9</u>	(±4.6)	<u>19.5</u>	(±2.4)
Total	100.0		100.0		100.0		100.0		100.0	

More operations overall (49.6 percent) reported intramuscular as the primary route of veterinarian-delivered injections compared to producer-delivered injections (37.0 percent, see 3.c. above). These results could reflect the type of products that veterinarians are delivering to cattle and their approved routes of administration. As with producer-delivered injections, it was less common for veterinarian-delivered injections to be predominantly by the intramuscular route on the largest operations (25.2 percent) compared to the smallest operations (56.4 percent).

**Percent of Operations\* Where the Main Route for Veterinarian-Given Injections Was Intramuscular by Herd Size**



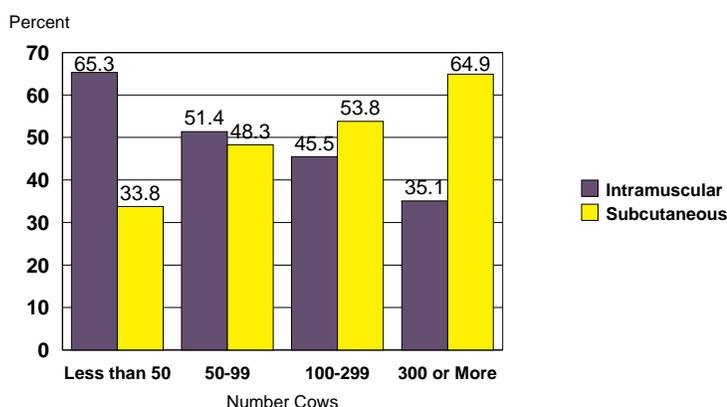
\*For operations where a veterinarian gave injections to any beef cattle in 1996.

#3491

d. For operations where a veterinarian gave injections to any beef cattle in 1996, operation average percent of veterinarian-delivered injections by route and herd size:

Route	Operation Average Percent																			
	Less Than 50		Standard Error		50-99		Standard Error		100-299		Standard Error		300 or More		Standard Error		All Ops.		Standard Error	
Intramuscular	65.3	(±3.7)	51.4	(±3.3)	45.5	(±3.3)	35.1	(±4.6)	59.0	(±2.5)										
Subcutaneous	33.8	(±3.7)	48.3	(±3.3)	53.8	(±3.3)	64.9	(±4.6)	40.3	(±2.5)										
Other	0.9	(±0.5)	0.3	(±0.2)	0.7	(±0.4)	0.0	(±0.0)	0.7	(±0.3)										
Total	100.0		100.0		100.0		100.0		100.0											

**Operation Average Percent of Veterinarian-Given Injections by Route & Herd Size**



\*For operations where a veterinarian gave injections to any beef cattle in 1996.

#3492

e. For operations where a veterinarian gave injections to any beef cattle in 1996, percent of operations using only one injection route or a mixture of injection routes by herd size:

Route	Percent Operations																			
	Less Than 50		Standard Error		50-99		Standard Error		100-299		Standard Error		300 or More		Standard Error		All Ops.		Standard Error	
All intramuscular	52.6	(±4.6)	35.8	(±3.5)	30.4	(±3.3)	17.7	(±4.4)	45.3	(±3.1)										
All subcutaneous	22.7	(±3.8)	31.2	(±3.8)	36.9	(±4.0)	47.6	(±5.9)	27.0	(±2.6)										
All other	0.6	(±0.4)	0.0	(±0.0)	0.6	(±0.3)	0.0	(±0.0)	0.4	(±0.2)										
Mixture of above	24.1	(±3.8)	33.0	(±3.6)	32.1	(±3.7)	34.7	(±5.4)	27.3	(±2.6)										
Total	100.0		100.0		100.0		100.0		100.0											

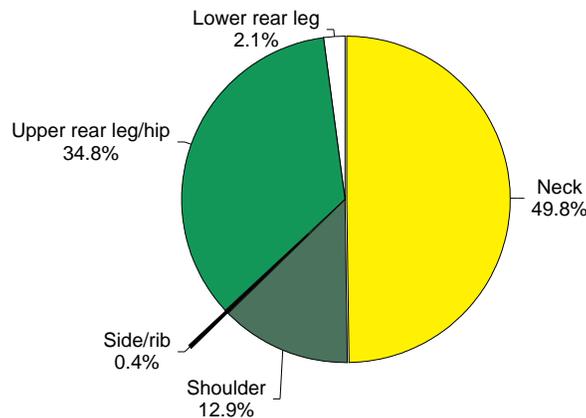
f. For operations where a veterinarian gave intramuscular or subcutaneous injections to any beef cattle in 1996, percent of operations by usual location of veterinarian-delivered injections by route:

<u>Location</u>	<u>Percent Operations</u>			
	<u>Route</u>		<u>Route</u>	
	<u>Intramuscular</u>	<u>Standard Error</u>	<u>Subcutaneous</u>	<u>Standard Error</u>
Neck	49.8	(±3.7)	82.2	(±3.7)
Shoulder	12.9	(±2.7)	10.5	(±3.4)
Side/rib	0.4	(±0.2)	0.8	(±0.3)
Upper rear leg/hip	34.8	(±3.6)	5.7	(±2.0)
Lower rear leg	<u>2.1</u>	(±0.6)	<u>0.8</u>	(±0.4)
Total	100.0		100.0	

For operations where a veterinarian delivered any injection in 1996, the usual location for intramuscular injections by the veterinarian was the neck (49.8 percent of operations). This percentage was higher than for producer-delivered injections (35.2 percent, see 3.f. above).

It may be that producers having a veterinarian make some injections are more attuned to beef quality and hence are using the neck more frequently. Alternatively, the veterinarian may be expressing some leadership in the issue of beef quality and injecting the neck location more frequently than the producers themselves. Still, a substantial percentage of operations reported that veterinarians' usual location for intramuscular injections was the rear leg (34.8 + 2.1 = 36.9 percent of operations). As noted above, there could be many reasons for this practice including a misunderstanding of the veterinarian's actual preferences regarding injection routes and locations.

**Percent of Operations by Usual Location of Veterinarian-Given Intramuscular Injections**



\*For operations where a veterinarian gave intramuscular injections to any beef cattle in 1996.

#3493

5. Calf death loss

a. Calves born dead, died, or were lost during 1996 as a percent of calves born in 1996 by age:

<u>Age</u>	<u>Percent Calves Died/Lost</u>	<u>Standard Error</u>
Born dead	2.1	(±0.1)
24 hours or less after birth	1.1	(±0.1)
More than 24 hours but less than 3 weeks after birth	1.1	(±0.1)
3 weeks or more after birth but before weaning	<u>1.2</u>	(±0.1)
Total	5.5	(±0.2)

Calves sold from the cow-calf operation is the single largest contributor to producers' income. Calf death loss represents a loss to producers since they have invested the costs of maintaining the cow through her pregnancy.

Overall 2.1 percent of the calves born in 1996 on cow-calf operations represented by this study were born dead. Another 1.1 percent of calves died in the first 24 hours of life.

Sometimes the distinction between calves born dead and those that died in the first 24 hours can be difficult without a necropsy evaluation of the carcass. However, it appears that 3.2 percent of calves die early in life and do not successfully adapt to the environment outside the uterus. This problem could be related to dystocia (difficult birth), congenital malformations, weather, or other causes. Beyond 24 hours of age up until weaning, 2.3 percent of calves (1.1 + 1.2 percent) died. These data show that the time surrounding the calving and the first 24 hours is immensely important to the calf's ability to survive and ultimately to the operation's income.

b. Unweaned calves that died or were lost to all causes in 1996 as a percent of calves born alive during 1996 by herd size:

<u>Less Than 50</u>		<u>50-99</u>		<u>100-299</u>		<u>300 or More</u>		<u>All Ops.</u>	
<u>Standard Error</u>									
3.7	(±0.3)	3.3	(±0.2)	3.2	(±0.2)	3.4	(±0.2)	3.4	(±0.1)

Perhaps surprisingly, overall losses of calves that were reported born alive was similar across all size ranges of cow-calf operations.

c. Percent of operations by percent of unweaned calves that died or were lost to all causes prior to weaning in 1996 (number died in 1996 as a percent of number born alive in 1996) by herd size:

Percent Calves Died/Lost	Percent Operations Number Cows									
	Less Than 50	Standard Error	50-99	Standard Error	100-299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
0	65.1	(±2.3)	36.0	(±2.9)	16.3	(±2.4)	6.9	(±2.1)	55.1	(±1.8)
0.1 - 0.9	0.0	(±0.0)	0.1	(±0.1)	9.9	(±2.0)	5.8	(±1.7)	1.1	(±0.2)
1.0 - 1.9	0.6	(±0.2)	11.2	(±1.5)	13.8	(±1.7)	23.3	(±3.5)	3.8	(±0.3)
2.0 - 4.9	9.6	(±1.1)	27.8	(±2.4)	35.0	(±2.8)	41.7	(±4.5)	15.3	(±0.9)
5.0 - 9.9	10.0	(±1.2)	19.9	(±2.0)	21.0	(±2.3)	19.2	(±3.2)	12.7	(±0.9)
10.0 or more	<u>14.7</u>	(±1.9)	<u>5.0</u>	(±1.0)	<u>4.0</u>	(±0.8)	<u>3.1</u>	(±1.3)	<u>12.0</u>	(±1.4)
Total	100.0		100.0		100.0		100.0		100.0	

Percentages of operations that reported varying levels of losses were different by herd size. Nearly two-thirds (65.1 percent) of the smallest herds reported no calves lost. Operations of this size also had the highest proportion that lost 10 percent or more of their calves (14.7 percent). This fact is likely to be a reflection of the small size of these herds. Loss of a single calf in a herd with only 10 calves born alive results in a 10 percent loss which probably explains why there were very few small operations that experienced losses in the range of 0.1 to 1.9 percent.

d. For unweaned calves that died or were lost in 1996, percent of calf losses in 1996 by perceived cause:

Perceived Cause	Percent of Total Losses	Standard Error
Digestive problems	14.4	(±1.0)
Respiratory problems	16.3	(±1.2)
Weather	20.2	(±1.4)
Calving problems	13.9	(±1.3)
Poisoning	1.3	(±0.7)
Predators	6.4	(±0.7)
Theft	0.8	(±0.3)
Other known	9.2	(±0.9)
Unknown	<u>17.5</u>	(±1.4)
Total	100.0	

The single largest category of losses for unweaned calves in 1996 was weather conditions (20.2 percent of all calves lost), according to producers. This result is in contrast to some study reports that cite a higher proportion of early calf losses due to calving problems. Unknown reasons, the second largest category, accounted for 17.5 percent of the losses. Respiratory problems (16.3 percent), digestive problems (14.4 percent), and calving problems (13.9 percent) rounded out producers' top five reasons for losses. All other categories of losses each accounted for less than 10 percent of the total losses of unweaned calves for 1996.

6. Calf morbidity

a. Number of unweaned calves affected with the following conditions during 1996 as a percent of calves born alive in 1996 by calf age group:

<u>Conditions</u>	<u>Percent Calves</u>			
	<u>3 Weeks Old or Less</u>	<u>Standard Error</u>	<u>Unweaned Over 3 Weeks</u>	<u>Standard Error</u>
Respiratory disease	0.5	(±0.1)	0.8	(±0.1)
Scours or diarrhea	2.4	(±0.2)	1.7	(±0.2)
Pinkeye	0.1	(±0.0)	1.1	(±0.1)
Foot rot	N/A	N/A	0.2	(±0.0)

Overall 2.4 percent of calves were reported to have experienced an episode of diarrhea in the first 3 weeks of life. It should not be surprising that diarrhea was the most common illness reported for calves in this age class. This number (2.4 percent) may actually under-report the number of cases of diarrhea in young calves since on extensively managed operations calves may not be observed with enough regularity for the illness to have been seen. Diarrhea was again the most common (1.7 percent of calves) of the four diseases listed for calves in the age range of 3 weeks to weaning.

b. Percent of operations by percent of unweaned calves affected by *respiratory disease* in 1996 by calf age group:

<u>Percent Calves with Respiratory Disease</u>	<u>Percent Operations</u>			
	<u>3 Weeks Old or Less</u>	<u>Standard Error</u>	<u>Unweaned Over 3 Weeks</u>	<u>Standard Error</u>
0	93.5	(±0.7)	91.4	(±0.7)
0.1 - 1.9	1.4	(±0.2)	2.1	(±0.2)
2.0 - 4.9	2.1	(±0.4)	2.8	(±0.3)
5.0 - 9.9	1.8	(±0.4)	2.0	(±0.3)
10.0 or more	<u>1.2</u>	(±0.4)	<u>1.7</u>	(±0.4)
Total	100.0		100.0	

c. Percent of operations by percent of unweaned calves affected by *scours or diarrhea* in 1996 by calf age group:

<u>Percent Calves with Scours or Diarrhea</u>	<u>Percent Operations</u>			
	<u>3 Weeks Old or Less</u>	<u>Standard Error</u>	<u>Unweaned Over 3 Weeks</u>	<u>Standard Error</u>
0	84.4	(±1.0)	88.9	(±0.9)
0.1 - 1.9	1.5	(±0.2)	1.0	(±0.1)
2.0 - 4.9	3.2	(±0.3)	3.0	(±0.5)
5.0 - 9.9	4.7	(±0.5)	3.0	(±0.5)
10.0 or more	<u>6.2</u>	(±0.7)	<u>4.1</u>	(±0.5)
Total	100.0		100.0	

d. Percent of operations by percent of unweaned calves affected by *pinkeye* in 1996 and calf age group:

<u>Percent Calves with Pinkeye</u>	<u>3 Weeks or Less of Age</u>		<u>Over 3 Weeks of Age</u>	
	<u>Percent Operations</u>	<u>Standard Error</u>	<u>Percent Operations</u>	<u>Standard Error</u>
0	99.4	(±0.2)	88.7	(±1.0)
0.1 - 1.9	0.1	(±0.0)	0.7	(±0.1)
2.1 - 4.9	0.2	(±0.1)	3.0	(±0.4)
5.0 - 9.9	0.2	(±0.1)	2.5	(±0.4)
10.0 or more	<u>0.1</u>	(±0.1)	<u>5.1</u>	(±0.8)
Total	100.0		100.0	

e. Percent of operations by percent of unweaned calves over 3 weeks of age affected by *foot rot* in 1996 by calf age group:

<u>Percent Calves with Footrot</u>	<u>Percent Operations</u>	<u>Standard Error</u>
0	96.8	(±0.4)
0.1 - 1.9	1.3	(±0.2)
2.1 - 4.9	0.9	(±0.2)
5.0 - 9.9	0.6	(±0.2)
10.0 or more	<u>0.4</u>	(±0.2)
Total	100.0	

7. Cattle death loss

a. Beef breeding cattle (weaned replacement heifers, cows, and bulls) that died or were lost to all causes in 1996 as a percent of January 1, 1997, beef breeding cattle inventory by herd size:

Percent Cattle Died/Lost									
Number Cows									
Less Than 50	Standard Error	50-99	Standard Error	100-299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
2.4	(±0.3)	1.4	(±0.1)	1.2	(±0.1)	1.0	(±0.1)	1.5	(±0.1)

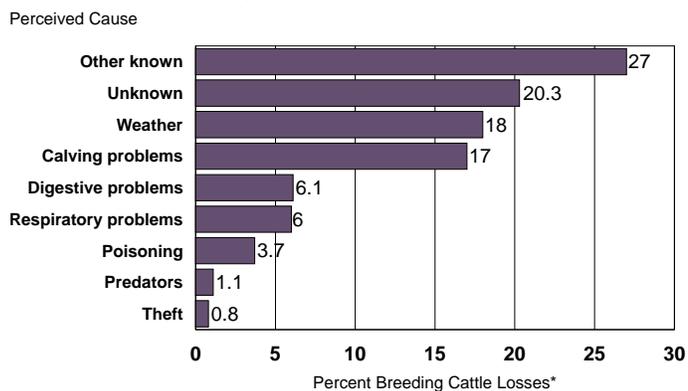
Only 1.5 percent of the adult beef breeding herd referenced by this study died or were lost during 1996. There was a trend toward lower losses of breeding cattle with increasing herd size. The largest operations experienced half as many losses (1.0 percent) as the smallest operations (2.4 percent).

b. For beef breeding cattle (weaned replacement heifers, cows, and bulls) that died or were lost in 1996, percent of breeding cattle losses by perceived cause:

Perceived Cause	Percent of Total Losses	Standard Error
Digestive problems	6.1	(±0.1)
Respiratory problems	6.0	(±1.0)
Weather	18.0	(±3.9)
Calving problems	17.0	(±1.9)
Poisoning	3.7	(±0.6)
Predators	1.1	(±0.3)
Theft	0.8	(±0.3)
Other known	27.0	(±2.8)
Unknown	<u>20.3</u>	(±2.2)
Total	100.0	

The largest single category of losses for beef breeding cattle was “other known” conditions. Where they actually specified a reason, producers attributed most of these losses to old age. Producers could not attribute one-fifth (20.3 percent) of losses to a reason.

**Percent of Breeding Cattle Losses\* in 1996 by Perceived Cause**



\*For beef breeding cattle (weaned replacement heifers, cows, and bulls) that died or were lost in 1996.

#3495

8. Breeding female morbidity

a. Breeding females affected by the following conditions in 1996 as a percent of January 1, 1997, respective inventory:

<u>Conditions</u>	<u>Percent Breeding Females</u>					
	<u>Replacement Heifers</u>	<u>Standard Error</u>	<u>Cows</u>	<u>Standard Error</u>	<u>All Females</u>	<u>Standard Error</u>
Respiratory disease	0.9	(±0.3)	0.3	(±0.0)	0.4	(±0.1)
Scours or diarrhea	1.0	(±0.2)	0.4	(±0.1)	0.5	(±0.1)
Pinkeye	1.9	(±0.4)	1.2	(±0.1)	1.3	(±0.1)
Cancer eye	0.0	(±0.0)	0.3	(±0.0)	0.2	(±0.0)
Foot rot	0.8	(±0.2)	0.8	(±0.1)	0.8	(±0.1)
Mastitis	N/A	N/A	0.2	(±0.0)	0.2	(±0.0)
Retained placenta or uterine infection	N/A	N/A	0.4	(±0.0)	0.3	(±0.0)
Abortion	0.3	(±0.1)	0.3	(±0.0)	0.3	(±0.0)
Neurologic problems	0.0	(±0.0)	0.1	(±0.0)	0.1	(±0.0)

As expected, relatively few of the breeding females in cow-calf herds experienced illness events. In most cases replacement heifers had higher illness rates than cows. An exception was the cancer eye category in which the disease would be expected to occur more frequently in cows than in heifers.

b. Breeding females affected by the following conditions in 1996 as a percent of January 1, 1997, total breeding female inventory by herd size:

<u>Conditions</u>	<u>Percent Breeding Females</u>									
	<u>Less Than 50</u>		<u>50-99</u>		<u>100-299</u>		<u>300 or More</u>		<u>All Ops.</u>	
	<u>Standard Error</u>	<u>Standard Error</u>	<u>Standard Error</u>	<u>Standard Error</u>	<u>Standard Error</u>	<u>Standard Error</u>	<u>Standard Error</u>	<u>Standard Error</u>	<u>Standard Error</u>	
Respiratory disease	0.5	(±0.1)	0.3	(±0.1)	0.3	(±0.1)	0.5	(±0.2)	0.4	(±0.1)
Scours or diarrhea	0.7	(±0.2)	0.5	(±0.1)	0.5	(±0.1)	0.4	(±0.1)	0.5	(±0.1)
Pinkeye	2.3	(±0.4)	1.5	(±0.2)	0.8	(±0.1)	0.6	(±0.2)	1.3	(±0.1)
Cancer eye	0.2	(±0.0)	0.3	(±0.0)	0.2	(±0.0)	0.2	(±0.0)	0.2	(±0.0)
Foot rot	0.8	(±0.1)	0.7	(±0.1)	1.0	(±0.4)	0.7	(±0.1)	0.8	(±0.1)
Mastitis	0.2	(±0.1)	0.2	(±0.0)	0.1	(±0.0)	0.1	(±0.0)	0.2	(±0.0)
Retained placenta or uterine infection	0.2	(±0.0)	0.3	(±0.1)	0.4	(±0.0)	0.2	(±0.0)	0.3	(±0.0)
Abortion	0.2	(±0.1)	0.2	(±0.0)	0.3	(±0.0)	0.3	(±0.0)	0.3	(±0.0)
Neurologic problems	0.2	(±0.1)	0.2	(±0.1)	0.1	(±0.1)	0.0	(±0.0)	0.1	(±0.0)

With the exception of pinkeye, illness rates for breeding females in the herd appeared fairly constant when separated by herd size. The smallest herds had a higher proportion of all females with pinkeye (2.3 percent) compared to the largest operations (0.6 percent). Since more small herds would be expected in the southeast part of the U.S., this result may be a reflection of the geographic distribution of these herds.

- c. For operations having the respective class of breeding females, percent of operations with at least one female affected by the following conditions in 1996:

<u>Conditions</u>	<u>Percent Operations</u>					
	Replacement Standard		Standard		All	Standard
	<u>Heifers</u>	<u>Error</u>	<u>Cows</u>	<u>Error</u>	<u>Females</u>	<u>Error</u>
Respiratory disease	2.4	(±0.4)	5.5	(±0.9)	6.5	(±1.0)
Scours or diarrhea	3.4	(±0.8)	3.7	(±0.7)	5.2	(±0.8)
Pinkeye	7.3	(±1.0)	15.2	(±1.3)	16.9	(±1.4)
Cancer eye	0.3	(±0.2)	7.7	(±0.7)	7.9	(±0.7)
Foot rot	2.6	(±0.4)	11.9	(±0.9)	12.3	(±0.9)
Mastitis	N/A	N/A	5.1	(±0.5)	5.1	(±0.5)
Retained placenta or uterine infection	N/A	N/A	7.1	(±0.5)	7.1	(±0.5)
Abortion	2.0	(±0.3)	6.1	(±0.5)	6.7	(±0.5)
Neurologic problems	0.3	(±0.1)	2.1	(±0.4)	2.2	(±0.4)

Since the illness rate among breeding females is low, it is not surprising that many operations did not have a single animal with the listed disease conditions. The most common disease conditions were pinkeye (16.9 percent of all operations reporting one or more cases) and foot rot (12.3 percent of all operations reporting one or more cases). All other conditions listed were each reported on less than 10 percent of operations.

- d. Percent of operations with at least one female affected by the following conditions during 1996 by herd size:

<u>Conditions</u>	<u>Percent Operations</u>							
	Number Cows							
	<u>Less Than 50</u>	<u>Standard Error</u>	<u>50-99</u>	<u>Standard Error</u>	<u>100-299</u>	<u>Standard Error</u>	<u>300 or More</u>	<u>Standard Error</u>
Respiratory disease	5.1	(±1.3)	7.5	(±1.2)	12.5	(±1.6)	28.1	(±4.0)
Scours or diarrhea	3.2	(±0.8)	10.4	(±2.6)	11.1	(±2.3)	17.8	(±3.3)
Pinkeye	14.1	(±1.8)	23.2	(±2.3)	27.2	(±2.6)	27.4	(±3.7)
Cancer eye	3.8	(±0.8)	14.3	(±1.7)	23.0	(±2.4)	45.8	(±4.4)
Foot rot	8.0	(±1.1)	17.9	(±1.9)	30.9	(±2.5)	46.0	(±4.4)
Mastitis	2.7	(±0.5)	9.5	(±1.7)	15.0	(±1.8)	17.7	(±3.4)
Retained placenta or uterine infection	2.8	(±0.5)	13.2	(±1.7)	25.2	(±2.3)	42.2	(±4.3)
Abortion	3.0	(±0.5)	9.0	(±1.4)	26.2	(±2.3)	40.3	(±4.4)
Neurologic problems	1.5	(±0.5)	3.6	(±0.9)	4.9	(±1.0)	8.6	(±2.0)

As expected when there are more animals on the operation, there is an increased likelihood that one or more cases of the specific disease conditions will be seen. In all cases (all categories of disease), the percentage of herds with one or more cases was higher for large herds than for small herds.

Nearly half of the largest herds experienced at least one case of cancer eye (45.8 percent) and foot rot (46.0 percent) among the breeding female herd. One potential explanation for the higher proportion of large herds with one or more cases of cancer eye is that there are more cows at risk in these herds. This explanation is substantiated by the lack of difference in percentages of breeding females affected by cancer eye by herd size shown in 8.b.

**B. Biosecurity**

Exposure of beef cattle on the operation to other species of animals or to new animals being brought onto the operation can be seen as a potential threat to the health status of the on-farm population. In this section we characterize the level of exposure and producers' measures to reduce the threat of introducing new disease agents onto the operation.

1. Animals on operation

a. Percent of operations (and percent of beef cows on these operations on January 1, 1997) where the following animals were present on the operation in 1996:

<u>Animals</u>	<u>Percent Operations</u>	<u>Standard Error</u>	<u>Percent Beef Cows</u>	<u>Standard Error</u>
Pigs	9.3	(±1.2)	11.1	(±1.2)
Sheep	4.5	(±0.6)	6.6	(±0.6)
Goats	5.1	(±0.9)	4.9	(±1.0)
Dairy cattle	4.1	(±0.9)	3.2	(±0.4)
Chickens, other poultry, or their litter	15.1	(±1.6)	15.1	(±1.5)
Horses or other equine	35.5	(±1.9)	54.7	(±1.6)
Exotic species (e.g., camelids, llamas, alpacas)	1.8	(±0.7)	1.9	(±0.4)
Dogs	70.8	(±1.9)	78.9	(±1.2)
Cats	57.3	(±2.0)	62.3	(±1.6)
Any of the above	85.1	(±1.6)	90.4	(±0.8)

Most of the cow-calf operations referenced by this study (85.1 percent) had some animal present on the operation other than beef cattle. The most frequent other species reported was dogs (70.8 percent of operations) followed by cats (57.3 percent), and horses (35.5 percent). Chickens, other poultry, or their litter were present on 15.1 percent of operations. For the most part, the percent of operations with the listed species was consistent with the percent of beef cows on those operations. These results indicate a lack of strong herd size differences. One exception was the presence of horses on 35.5 percent of the operations, but 54.7 percent of the beef cows resided on operations with horses. (This herd size trend is confirmed in Table 1.b.)

b. Percent of operations where the following animals were present on the operation in 1996 by herd size:

Class	<u>Percent Operations</u>							
	Less Than 50		Standard Error		Standard Error		Standard Error	
Pigs	8.6	(±1.6)	10.4	(±1.4)	12.1	(±2.1)	11.5	(±2.4)
Sheep	3.7	(±0.7)	4.8	(±0.9)	8.9	(±1.4)	10.6	(±2.6)
Goats	4.7	(±1.0)	7.5	(±2.5)	4.5	(±1.6)	2.9	(±1.4)
Dairy cattle	4.6	(±1.2)	2.5	(±0.7)	2.4	(±0.6)	4.7	(±1.7)
Chickens, other poultry, or their litter	15.8	(±2.1)	12.4	(±1.5)	14.2	(±2.1)	16.1	(±3.1)
Horses or other equine	29.9	(±2.4)	43.2	(±2.8)	57.9	(±2.8)	85.1	(±2.8)
Exotic species (e.g., camelids, llamas, alpacas)	1.8	(±0.9)	1.1	(±0.5)	2.1	(±0.6)	3.5	(±1.4)
Dogs	67.7	(±2.5)	77.3	(±2.1)	81.9	(±2.2)	84.9	(±2.9)
Cats	55.7	(±2.6)	58.6	(±2.8)	65.4	(±2.8)	69.9	(±3.7)
Any of the above	83.4	(±2.1)	88.3	(±1.6)	91.5	(±1.8)	97.5	(±1.2)

Generally the largest operations were slightly more likely to have each of the listed species present than smaller operations. The largest operations were much more likely (85.1 percent) to have horses on the operation than the smallest operations (29.9 percent).

## 2. Contact with other animals

a. Percent of operations (and percent of beef cows on these operations on January 1, 1997) where the following animals had any physical contact with beef cows, beef replacement heifers, or their feed, minerals, or water supply:

<u>Animals</u>	<u>Percent Operations</u>	<u>Standard Error</u>	<u>Percent Beef Cows</u>	<u>Standard Error</u>
Pigs	8.8	(±1.2)	10.5	(±1.2)
Sheep	5.0	(±0.6)	7.8	(±0.7)
Goats	5.6	(±1.0)	5.1	(±1.1)
Dairy cattle	5.0	(±0.9)	4.3	(±0.5)
Chickens, other poultry, or their litter	13.3	(±1.4)	12.4	(±1.2)
Horses or other equine	35.9	(±1.9)	54.2	(±1.6)
Exotic species (e.g., camelids, llamas, alpacas)	2.9	(±1.0)	2.6	(±0.5)
Dogs	73.0	(±1.8)	77.9	(±1.3)
Cats	58.6	(±2.0)	60.0	(±1.6)
Wild deer or other members of the deer family	79.6	(±1.7)	84.8	(±1.4)
Any of the above	94.2	(±0.9)	96.1	(±0.5)

Generally the percentage of operations where the listed species had contact with beef animals, their feed, or their water supply (Table 2.a.) was similar to the percentage of operations where the animals were actually present on the operations (Table 1.b.) Discrepancies in these numbers could be attributed to fence-line contact or indirect contact through feed or water brought from another operation.

- 3. Animals brought on
  - a. Percent of operations that brought any beef or dairy cattle or calves onto the operation in 1996 by class and herd size:

Class	<u>Percent Operations</u>									
	Number Cows									
	Less Than 50	Standard Error	50-99	Standard Error	100-299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Unweaned calves	5.6	(±1.3)	6.7	(±1.3)	6.3	(±1.1)	7.5	(±2.7)	5.8	(±1.0)
Beef heifers weaned but not bred	6.5	(±0.9)	11.3	(±1.5)	12.5	(±2.7)	11.1	(±2.7)	7.9	(±0.8)
Bred beef heifers	2.7	(±0.6)	6.4	(±1.2)	10.0	(±1.6)	9.8	(±3.0)	4.1	(±0.5)
Beef cows	12.5	(±2.0)	17.1	(±2.2)	16.0	(±1.8)	15.5	(±3.2)	13.6	(±1.5)
Weaned bulls	17.1	(±1.8)	28.5	(±2.3)	42.2	(±2.8)	56.2	(±4.2)	21.8	(±1.4)
Weaned steers	3.7	(±0.7)	4.3	(±0.9)	5.2	(±0.9)	10.0	(±2.6)	4.1	(±0.5)
Dairy heifers and cows	0.5	(±0.2)	1.1	(±0.4)	0.4	(±0.3)	2.2	(±1.3)	0.6	(±0.2)
Any cattle or calves	32.9	(±2.4)	48.7	(±2.8)	62.1	(±2.7)	74.5	(±3.6)	38.7	(±1.9)

Adding new cattle or calves to a herd can result in new disease agents being introduced. The percentage of new animals brought into the herd can vary depending on climatic and economic conditions.

Over one-third (38.7 percent) of operations had new cattle or calves brought onto the operation during 1996. The largest operations (300 or more cows) were much more likely (74.5 percent) to have brought on some new cattle or calves than the smallest operations (32.9 percent).

The largest category of new cattle brought onto operations in each size class was weaned bulls. This is to be expected since artificial insemination is not widely practiced in cow-calf herds and the introduction of bulls represents an efficient way to bring new genetics into the herd. However, a surprising number of operations (13.6 percent) reported the introduction of cows (females that have calved at least once) into their herds. Introducing cows can raise concerns for the introduction of infectious reproductive diseases.

- b. Percent of operations that brought any beef or dairy cattle or calves onto the operation in 1996 by region:

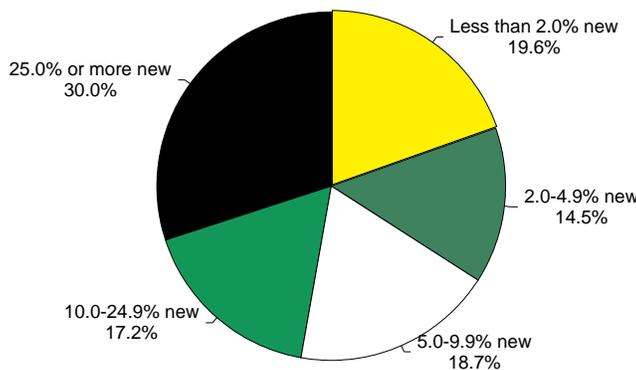
West	<u>Percent Operations</u>									
	Region									
Standard Error	North-central	Standard Error	South-central	Standard Error	Central	Standard Error	Southeast	Standard Error	Total	Standard Error
51.2 (±4.8)	58.4 (±3.2)	31.3 (±4.6)	46.5 (±4.1)	28.8 (±3.1)	38.7 (±1.9)					

c. For operations that brought any beef and dairy cattle or calves onto the operation in 1996, percent of operations by percent of new cattle or calves relative to January 1, 1997, total inventory by herd size:

Percent New Cattle & Calves	Percent Operations																					
	Less Than 50		Standard Error		50-99		Standard Error		100 -299		Standard Error		300 or More		Standard Error		All Ops.		Standard Error			
Less than 2.0	7.7	(±1.5)	34.1	(±3.3)	42.8	(±3.8)	56.8	(±5.1)	19.6	(±1.5)	14.5	(±1.8)	22.4	(±4.6)	13.1	(±2.2)	12.0	(±2.1)	10.6	(±2.8)	18.7	(±3.0)
2.0 - 4.9	14.2	(±2.6)	18.5	(±3.9)	12.2	(±2.2)	9.2	(±3.1)	17.2	(±2.1)	8.7	(±3.5)	19.2	(±3.2)	16.3	(±2.4)	12.1	(±2.1)	8.7	(±3.5)	17.2	(±2.1)
5.0 - 9.9	22.4	(±4.6)	13.1	(±2.2)	12.0	(±2.1)	10.6	(±2.8)	18.7	(±3.0)	14.7	(±3.5)	19.2	(±3.2)	16.3	(±2.4)	12.1	(±2.1)	8.7	(±3.5)	17.2	(±2.1)
10.0 - 24.9	19.2	(±3.2)	16.3	(±2.4)	12.1	(±2.1)	8.7	(±3.5)	17.2	(±2.1)	30.0	(±2.9)	19.2	(±3.2)	16.3	(±2.4)	12.1	(±2.1)	8.7	(±3.5)	17.2	(±2.1)
25.0 or more	36.5	(±4.3)	18.0	(±2.6)	20.9	(±4.0)	14.7	(±3.5)	30.0	(±2.9)	30.0	(±2.9)	36.5	(±4.3)	18.0	(±2.6)	20.9	(±4.0)	14.7	(±3.5)	30.0	(±2.9)
Total	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	

New additions to the herd represented a larger proportion of the herd inventory for smaller herds than for larger herds. New additions accounted for at least 25 percent of the herd on 36.5 percent of the smallest operations (fewer than 50 cows) compared to 14.7 percent of the largest operations (300 or more cows). This finding may in part be an artifact in that in a herd with 10 cows the introduction of a single new animal represents a 10 percent addition rate. The trend to lower addition rates in larger herds was apparent across all herd sizes. As herd size increased, the percentage of herds with any of the specified herd addition rates declined. For example the percentage of herds with a 5.0 to 9.9 percent addition rate declined with increasing herd size from 22.4 percent to 13.1 percent, 12.0 percent, and 10.6 percent.

**Percent of Operations by Percent of New Cattle or Calves \***



\*For operations that brought any beef or dairy cattle onto the operation in 1996. Percent of new cattle or calves relative to 1/1/97 total inventory.

#3496

d. Number of cattle and calves brought onto the operation in 1996 as a percent of January 1, 1997, total inventory by herd size:

Percent	Percent Cattle and Calves																		
	Less Than 50		Standard Error		50-99		Standard Error		100 -299		Standard Error		300 or More		Standard Error		All Ops.		Standard Error
Cattle and calves	36.8	(±3.6)	27.9	(±3.9)	28.1	(±5.3)	13.4	(±3.0)	26.6	(±2.4)									
Operation average	29.8	(±3.1)	22.4	(±4.9)	17.8	(±2.6)	10.0	(±1.6)	26.0	(±2.1)									

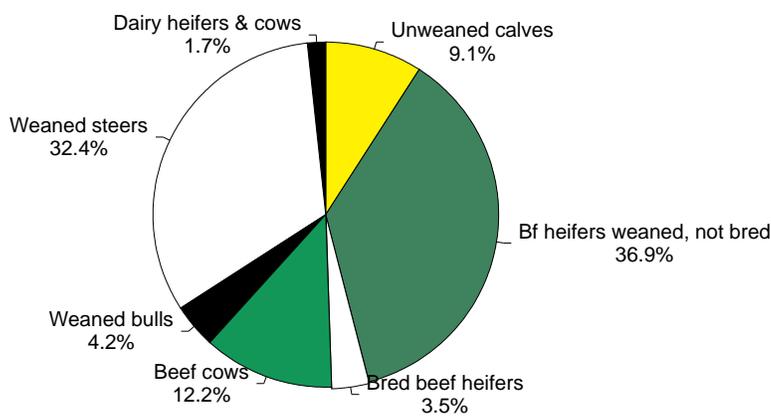
New additions brought onto all operations represented 26.6 percent of the total inventory of cattle and calves present on operations on January 1, 1997. The average addition rate reported for all operations was 26.0 percent. A larger percentage of cattle inventory was introduced during 1996 in small herds (36.8 percent) than in large herds (13.4 percent).

f. For operations that brought new cattle onto the operation in 1996, percent of new cattle brought on by class and herd size:

Class	Percent New Cattle																		
	Less Than 50		Standard Error		50-99		Standard Error		100 -299		Standard Error		300 or More		Standard Error		All Ops.		Standard Error
Unweaned calves	8.2	(±2.1)	11.7	(±3.5)	8.8	(±2.9)	7.9	(±4.6)	9.1	(±1.6)									
Beef heifers weaned but not bred	30.3	(±3.5)	34.5	(±5.7)	42.1	(±9.7)	39.2	(±11.9)	36.9	(±4.7)									
Bred beef heifers	2.6	(±0.8)	4.3	(±1.5)	3.5	(±1.0)	4.7	(±2.3)	3.5	(±0.6)									
Beef cows	14.5	(±2.4)	12.7	(±2.9)	9.5	(±2.7)	15.1	(±5.1)	12.2	(±1.6)									
Weaned bulls	3.9	(±0.6)	6.1	(±2.8)	3.2	(±1.3)	4.7	(±1.4)	4.2	(±0.8)									
Weaned steers	39.3	(±5.2)	27.9	(±6.1)	31.9	(±8.3)	24.5	(±6.4)	32.4	(±4.0)									
Dairy heifers and cows	<u>1.2</u>	(±0.6)	<u>2.8</u>	(±1.8)	<u>1.0</u>	(±1.0)	<u>3.9</u>	(±3.7)	<u>1.7</u>	(±0.7)									
Total	100.0		100.0		100.0		100.0		100.0										

Though weaned bulls were the most frequently reported (largest percentage of **operations** that brought bulls on the premises, Table 3.a.) class of cattle brought onto operations (21.8 percent), the largest percentages of new addition **animals** were for weaned heifers (36.9 percent of new additions) and weaned steers (32.4 percent of new additions). Weaned bulls actually represented a relatively small part (4.2 percent) of the total additions to all herds.

**Percent of New Cattle\* Brought on by Class**



\*For operations that brought new cattle onto the operation in 1996.

#3497

g. For operations that brought the following classes of new cattle or calves onto the operation in 1996, percent of operations that quarantined or separated all, some, or none of the new cattle by class:

<u>Class</u>	<u>Percent Operations</u>						<u>Total</u>
	<u>Standard</u>		<u>Standard</u>		<u>Standard</u>		
	<u>All</u>	<u>Error</u>	<u>Some</u>	<u>Error</u>	<u>None</u>	<u>Error</u>	
Unweaned calves	53.5	(±8.7)	0.0	(±0.0)	46.5	(±8.7)	100.0
Beef heifers weaned but not bred	49.3	(±4.9)	1.0	(±0.8)	49.7	(±4.9)	100.0
Bred beef heifers	43.6	(±6.1)	1.9	(±1.1)	54.5	(±6.1)	100.0
Beef cows	33.8	(±5.5)	0.4	(±0.2)	65.8	(±5.5)	100.0
Weaned bulls	26.8	(±2.7)	0.2	(±0.1)	73.0	(±2.8)	100.0
Weaned steers	56.5	(±6.2)	1.6	(±1.1)	41.9	(±6.2)	100.0
Dairy heifers and cows	43.0	(±13.4)	0.0	(±0.0)	57.0	(±13.4)	100.0
Any cattle or calves	32.7	(±2.7)	6.2	(±0.9)	61.1	(±2.8)	100.0

Quarantine, or the separation of new additions from the cattle and calves already on the operation, is one way to decrease risk of introducing new disease agents into the herd.

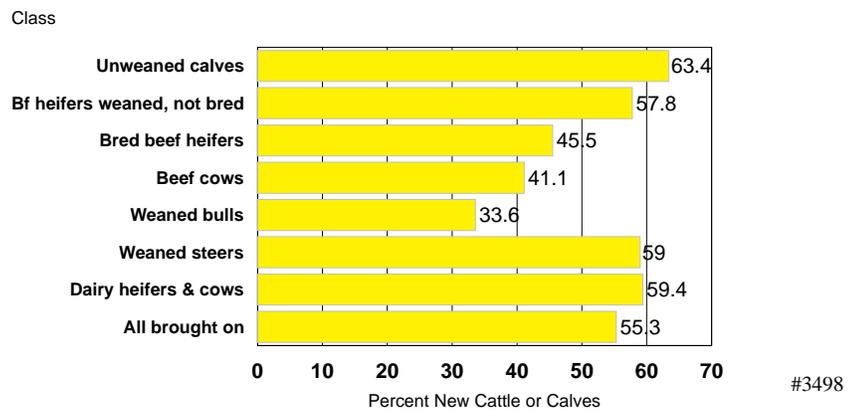
Only 32.7 percent of operations that brought on any new additions imposed a quarantine on all new additions. Another 6.2 percent of operations imposed a quarantine on some of the new additions leaving 61.1 percent of operations that added some new animals in 1996 that did not quarantine any new arrivals. Operations that added weaned bulls were least likely to impose any quarantine (26.8 + 0.2 = 27.0 percent).

h. Percent of new cattle or calves brought on that were quarantined or separated upon arrival by class:

<u>Class</u>	<u>Percent New Arrivals</u>	<u>Standard Error</u>
Unweaned calves	63.4	(±7.9)
Beef heifers weaned but not bred	57.8	(±10.0)
Bred beef heifers	45.5	(±7.2)
Beef cows	41.1	(±4.9)
Weaned bulls	33.6	(±9.0)
Weaned steers	59.0	(±8.1)
Dairy heifers and cows	59.4	(±19.8)
All brought on	55.3	(±5.6)

Overall 55.3 percent of new arrivals on operations went through some quarantine period prior to introduction into the herd. Unweaned beef calves that were introduced were the most likely to be quarantined (63.4 percent of new introductions). Weaned bulls were the least likely to be quarantined with only 33.6 percent of new weaned bulls being held separate for any period of time.

**Percent of New Cattle or Calves Brought on that Were Quarantined on Arrival by Class**



- i. For operations that brought any of the following classes of new cattle or calves on the operation, percent of operations by class and days quarantined or separated:

Class	Percent Operations										
	Number of Days Quarantined										
	None	Standard Error	1-20	Standard Error	21-40	Standard Error	41-149	Standard Error	150 or More	Standard Error	Total
Unweaned calves	46.5	(±8.7)	32.0	(±9.5)	4.6	(±1.5)	9.4	(±2.8)	7.5	(±5.9)	100.0
Beef heifers weaned but not bred	49.7	(±4.9)	18.1	(±4.1)	15.0	(±3.1)	12.3	(±3.5)	4.9	(±1.5)	100.0
Bred beef heifers	54.5	(±6.2)	18.7	(±5.2)	6.8	(±2.0)	19.3	(±4.9)	0.7	(±0.6)	100.0
Beef cows	65.8	(±5.5)	21.4	(±5.2)	6.9	(±1.6)	4.8	(±1.5)	1.1	(±0.5)	100.0
Weaned bulls	73.0	(±2.8)	11.7	(±2.2)	8.0	(±1.2)	6.5	(±1.3)	0.8	(±0.4)	100.0
Weaned steers	41.9	(±6.2)	17.5	(±4.2)	20.9	(±6.6)	14.0	(±5.1)	5.7	(±2.1)	100.0
Dairy heifers and cows	57.0	(±13.4)	19.2	(±8.9)	19.9	(±14.6)	3.9	(±3.8)	0.0	(±0.0)	100.0

Effectiveness of quarantine at preventing introduction of new disease agents is directly related to the length of the quarantine period. Among the operations that used any quarantine period, generally 20 days or less was the most frequently reported duration.

- j. For operations that quarantined/separated the following classes of animals, operation average and animal average days quarantined/separated by class:

Class	Average Days					
	Operation		Animal		Median	Mode
	Average	Standard Error	Average	Standard Error		
Unweaned calves	40	(±16)	44	(±10)	14	2
Beef heifers weaned but not bred	51	(±7)	43	(±10)	30	30
Bred beef heifers	43	(±7)	47	(±8)	30	60
Beef cows	26	(±5)	65	(±16)	14	7
Weaned bulls	37	(±4)	35	(±4)	30	30
Weaned steers	57	(±10)	127	(±55)	30	30
Dairy heifers and cows	24	(±5)	38	(±9)	30	30

For operations that used some quarantine period for the classes of new additions listed, the average reported duration ranged from 24 days (dairy heifers and cows) to 57 days (weaned steers). The long durations reported for weaned steers (57 days) and weaned heifers (51 days) was due to a few operations with very long separation periods (in excess of 150 days, Table 3.i.). Considering the number of animals reported to be separated for varying amounts of time, the animal average separation time is roughly consistent with the operation average time (indicating little difference by herd size) with the exception of beef cows and weaned steers.

The most commonly reported quarantine period (mode) ranged from 2 to 60 days for various classes of animals introduced.

The median represents the middle value of those reported such that half of the operations would be expected to have quarantine periods below the median and half above the median. The middle value of quarantine period was either 14 or 30 days for all classes of animals introduced.

### C. Nutrition Management

Generally nutrition-related costs account for 60 percent or more of the carrying costs of the cow herd. Because these costs represent such a substantial part of the maintenance costs for the herd, it is important to characterize how producers are meeting their animals' nutrient needs for maintenance and growth and to identify areas where efficiency could be improved.

1. Source of nutritional information

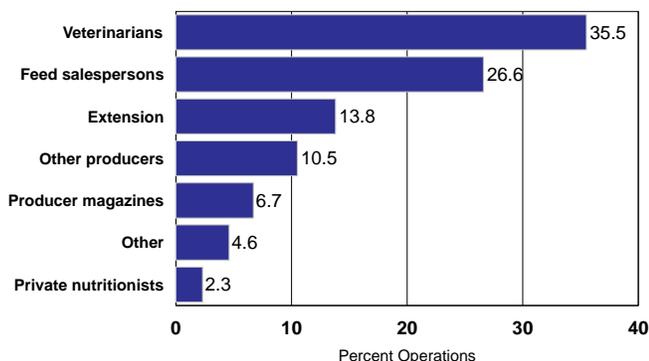
a. Percent of operations by the single most important off-farm source of information on animal nutrition and herd size:

Source	Percent Operations									
	Less Than 50		50-99		100 -299		300 or More		All Ops.	
	Standard Error	Standard Error	Standard Error	Standard Error	Standard Error	Standard Error	Standard Error	Standard Error	Standard Error	
Private nutritionists	1.2	(±0.4)	3.4	(±1.2)	7.9	(±1.4)	14.0	(±3.0)	2.3	(±0.4)
Feed salespersons or retailers	27.2	(±2.3)	26.0	(±2.7)	22.4	(±2.1)	28.8	(±3.9)	26.6	(±1.8)
Veterinarians	35.3	(±2.6)	40.1	(±2.7)	32.0	(±2.5)	24.0	(±3.7)	35.5	(±2.0)
Extension agents or specialists	13.6	(±1.7)	13.6	(±1.7)	15.0	(±1.9)	15.2	(±3.5)	13.8	(±1.3)
Other producers	10.7	(±1.5)	7.7	(±1.2)	12.8	(±2.7)	11.0	(±2.6)	10.5	(±1.2)
Producer magazines	7.1	(±1.5)	4.7	(±1.1)	6.9	(±1.9)	6.2	(±1.9)	6.7	(±1.2)
Other	4.9	(±1.0)	4.5	(±1.2)	3.0	(±0.9)	0.8	(±0.6)	4.6	(±0.7)
Total	100.0		100.0		100.0		100.0		100.0	

Nutritional management of the cow-calf herd is key to profitability. Many producers possess substantial knowledge about nutrition either through formal training or experience.

Producers looked to the veterinarian most frequently (35.5 percent of operations) as an off-farm source of information on animal nutrition. Feed salespersons or retailers were the next most frequent (26.6 percent) source of nutrition information. The most important source of off-farm information on animal nutrition varied by the size of the herd. Private nutritionists were much more frequently cited on the largest operations (14.0 percent) compared to the smallest operations (1.2 percent). Importance of the veterinarian declined with increasing herd size from 35.3 percent of the smallest operations to 24.0 percent of the largest operations. Other categories of nutrition information sources were relatively constant across herd size categories.

**Percent of Operations by the Most Important Source of Information on Animal Nutrition**



- 2. Use of calculated balanced rations
  - a. Percent of operations that usually calculated a balanced ration using either published feed values or results of feed analyses by herd size:

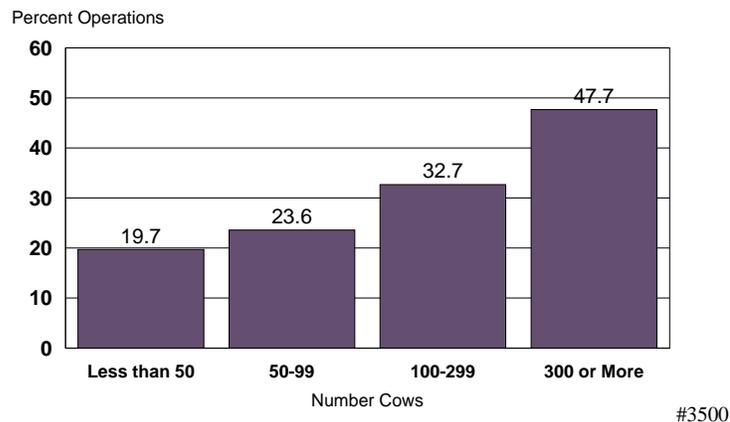
<u>Percent Operations</u>									
Number Cows									
Less Than 50	Standard Error	50-99	Standard Error	100-299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
19.7	(±2.0)	23.6	(±2.2)	32.7	(±2.5)	47.7	(±4.4)	22.0	(±1.5)

Calculating a balanced ration for animals in the herd is the first step toward achieving economic efficiency in the feeding program. Without calculating a balanced ration, some nutrients are possibly overfed (a waste of money) and some nutrients underfed, leading to poorer performance.

Overall only 22.0 percent of producers reported that they calculated a balanced ration. The practice was much more common in the largest operations (47.7 percent) compared to the smallest operations (19.7 percent).

Some producers may be relying on past experience with animal performance and feed compositions to make decisions about feeding programs without actually balancing a ration for key components. However, it seems likely that if producers are not calculating a balanced ration, they are not achieving a high degree of economic efficiency in their feeding program while maintaining optimal animal performance.

**Percent of Operations that Usually Calculated a Balanced Ration\* by Herd Size**



- b. For operations that usually calculated a balanced ration, percent of operations basing the ration on both the animals' requirements and quality of feedstuffs available by herd size:

<u>Percent Operations</u>									
Number Cows									
Less Than 50	Standard Error	50-99	Standard Error	100-299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
91.8	(±4.5)	95.4	(±1.7)	97.0	(±1.2)	97.1	(±1.7)	93.3	(±3.0)

3. Laboratory analysis of feed

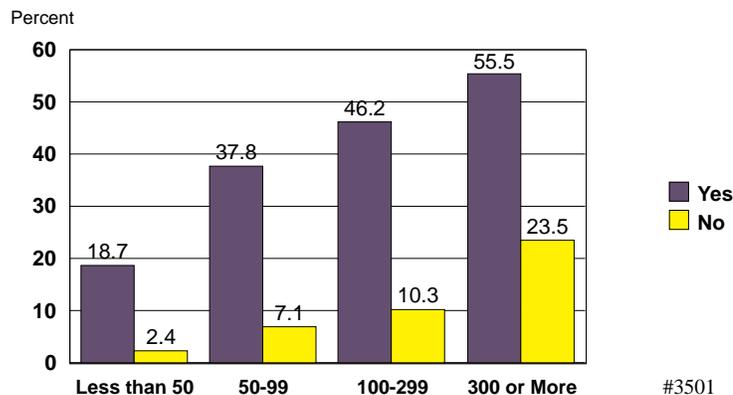
a. Percent of operations that submitted samples of feed to a laboratory for nutritional analysis in 1996 by use of calculated balanced ration by herd size:

Calculated Balanced Ration	Percent Operations																			
	Less Than 50		Standard Error		50-99		Standard Error		100-299		Standard Error		300 or More		Standard Error		All Ops.		Standard Error	
Yes	18.7	(±3.3)	37.8	(±4.7)	46.2	(±4.1)	55.5	(±6.5)	26.9	(±2.6)										
No	2.4	(±0.6)	7.1	(±1.6)	10.3	(±1.9)	23.5	(±5.9)	4.0	(±0.5)										
All operations	5.6	(±0.7)	14.3	(±1.7)	21.9	(±2.1)	38.7	(±4.3)	9.0	(±0.6)										

Nutrient content of feeds can vary greatly based on the time of harvest, variety, location, and other factors. While the use of general rules or book values is of some value in balancing rations, the best results can be achieved if feed samples are actually analyzed for their nutrient content.

Only 9.0 percent of operations analyzed any feed samples in 1996. Of those operations that calculated a balanced ration, only 26.9 percent did so based on laboratory analyses of samples they submitted. So the majority of operations (73.1 percent) that calculated a balanced ration used only book values or some other method of estimating nutrient contents to calculate the balanced ration. Some operations (4.0 percent) that did not calculate a balanced ration for their animals did submit samples for laboratory analysis. In some cases these producer may have submitted samples for specific analyses, such as nitrate levels, and not for a more general nutrient analysis of the feed. In all cases (balanced ration or not) laboratory analysis of feed samples was much more common on larger operations than for smaller operations.

**Percent of Operations that Submitted Samples of Feed to a Laboratory for Nutritional Analysis in 1996 by Use of a Calculated Balanced Ration & Herd Size**



4. Mineral deficiency

a. Percent of operations (and beef cows on those operations) where producers attributed reproductive or health problems to mineral deficiencies in the past 5 years by mineral:

<u>Mineral</u>	<u>Percent Operations</u>	<u>Standard Error</u>	<u>Percent Beef Cows</u>	<u>Standard Error</u>
Phosphorus	0.4	(±0.1)	0.8	(±0.2)
Copper	0.9	(±0.2)	3.0	(±1.0)
Selenium	1.4	(±0.2)	3.6	(±1.0)
Zinc	0.4	(±0.2)	1.8	(±1.0)
Magnesium	2.0	(±0.3)	3.5	(±0.5)
Other mineral	1.2	(±0.4)	1.2	(±0.3)
Any mineral	5.2	(±0.6)	9.7	(±1.2)

Relatively few operations (5.2 percent) reported any known mineral deficiencies in the previous 5 years. In most cases the percentage of cows represented by these operations was higher than the percentage of operations, indicating that larger herds were more likely to have known mineral deficiency problems. In fact, these percentages probably severely underestimate the true magnitude of mineral deficiencies in cow-calf herds. Laboratory data from a 1993 cow-calf study suggested that the extent of marginal and severe deficiency, at least for copper and selenium, is much more widespread.

b. Percent of operations where a magnesium supplement was provided to any beef cattle in 1996 by herd size:

<u>Less Than 50</u>		<u>50-99</u>		<u>100-299</u>		<u>300 or More</u>		<u>All Ops.</u>	
<u>Standard Error</u>									
62.7	(±2.5)	66.2	(±2.9)	64.3	(±3.1)	70.7	(±3.7)	63.5	(±1.9)

Nearly two-thirds (63.5 percent) of operations supplemented cattle with a magnesium supplement in 1996. This percentage was roughly similar for all sizes of operations.

c. Percent of operations where a magnesium supplement was provided to any beef cattle during 1996 by region:

<u>West</u>		<u>North-central</u>		<u>South-central</u>		<u>Central</u>		<u>Southeast</u>	
<u>Standard Error</u>									
48.0	(±4.3)	65.3	(±3.1)	52.2	(±5.0)	67.5	(±3.8)	74.5	(±3.0)

The percent of operations using magnesium supplement varied by geographic region with herds in the west being the least likely (48.0 percent) to supplement. Herds in the southeast were most likely (74.5 percent) to provide some supplemental magnesium.

## 5. Implanting practices

a. Percent of operations that implanted calves prior to or at weaning during 1996 by practice and herd size:

Practice	Percent Operations																			
	Less Than 50		Standard Error		50-99		Standard Error		100 -299		Standard Error		300 or More		Standard Error		All Ops.		Standard Error	
Any calves prior to weaning:	8.6	(±0.9)	21.7	(±2.0)	39.9	(±2.8)	55.4	(±4.3)	14.3	(±0.8)										
Heifers intended for replacement																				
prior to weaning	2.0	(±0.4)	6.8	(±1.3)	14.8	(±2.1)	25.9	(±3.7)	4.4	(±0.4)										
Other calves prior to weaning	8.5	(±0.9)	21.5	(±2.0)	39.7	(±2.8)	55.2	(±4.3)	14.2	(±0.8)										
Any calves at weaning:	7.1	(±1.3)	17.8	(±1.8)	25.8	(±2.4)	26.5	(±3.9)	10.8	(±1.0)										
Heifers intended for replacement at weaning	1.7	(±0.9)	3.5	(±0.8)	3.7	(±0.7)	8.1	(±2.4)	2.2	(±0.7)										
Other calves at weaning	6.1	(±1.0)	17.0	(±1.8)	24.6	(±2.4)	25.6	(±3.8)	9.8	(±0.8)										
Any calves prior to or at weaning:	12.7	(±1.5)	28.0	(±2.2)	44.3	(±2.8)	59.0	(±4.3)	18.8	(±1.1)										
Heifers intended for replacement prior to or at weaning:	3.4	(±1.0)	8.0	(±1.3)	16.6	(±2.1)	28.8	(±3.9)	5.8	(±0.8)										
Other calves prior to or at weaning:	11.7	(±1.2)	27.6	(±2.2)	44.0	(±2.8)	59.0	(±4.3)	18.0	(±1.0)										

Implanting of calves has been used to enhance growth of both suckling and weaned calves. Some concerns have been expressed about the use of implants in animals intended for breeding.

Overall 14.3 percent of all operations used some implants in calves prior to weaning. Use of implants prior to weaning was more common in the largest operations (55.4 percent) compared to the smallest operations (8.6 percent). Only 4.4 percent of operations reported implanting heifers intended for breeding prior to weaning. However, 25.9 percent of operations with 300 or more cows reported implanting heifers intended for breeding prior to weaning. Fewer operations (10.8 percent) implanted calves at the time of weaning than prior to weaning (14.3 percent). Once again more of the larger operations used this practice than smaller operations. Only 5.8 percent of operations implanted some replacement heifers either prior to or at weaning. Nearly one-fifth (18.0 percent) of producers implanted calves other than replacement heifers either before or at weaning.

b. Number of calves born on operations that implanted as a percent of calves born alive on all operations by practice and herd size:

Practice	Percent Calves Born																			
	Less Than 50		Standard Error		50-99		Standard Error		100 -299		Standard Error		300 or More		Standard Error		All Ops.		Standard Error	
Any calves prior to weaning:	13.0	(±1.5)	24.1	(±2.2)	41.0	(±3.2)	58.4	(±5.2)	33.0	(±1.6)										
Heifers intended for replacement prior to weaning	2.7	(±0.5)	8.2	(±1.6)	15.2	(±2.2)	23.3	(±3.7)	11.8	(±1.0)										
Other calves prior to at weaning	12.8	(±1.5)	23.8	(±2.2)	40.8	(±3.2)	58.2	(±5.2)	32.8	(±1.6)										
Any calves at weaning:	8.1	(±1.1)	18.5	(±1.8)	26.0	(±2.6)	24.9	(±4.0)	19.1	(±1.2)										
Heifers intended for replacement weaning	1.3	(±0.4)	3.8	(±0.9)	3.9	(±0.8)	7.3	(±2.3)	3.8	(±0.6)										
Other calves at weaning	7.6	(±1.1)	17.7	(±1.8)	24.9	(±2.6)	24.3	(±4.0)	18.4	(±1.2)										
Any calves prior to or at weaning:	16.8	(±1.6)	30.3	(±2.4)	45.4	(±3.4)	61.2	(±5.2)	37.3	(±1.7)										
Heifers intended for replacement prior to or at weaning:	3.7	(±0.6)	9.4	(±1.6)	17.5	(±2.3)	26.5	(±4.1)	13.7	(±1.1)										
Other calves prior to or at weaning:	16.4	(±1.6)	29.9	(±2.4)	45.2	(±3.4)	61.2	(±5.2)	37.0	(±1.7)										

Since implanting was more common on larger operations (Table 5.a.) it is not surprising that a larger proportion of calves resided on operations that implanted some calves. Overall 33.0 percent of calves born alive in 1996 were on operations that implanted some calves prior to weaning. Operations that implanted some calves at weaning accounted for a smaller proportion (19.1 percent) of the calves born alive.

c. Percent of operations by number of times unweaned *heifers intended for replacement* were implanted *prior to weaning* by herd size:

Number Implants	Percent Operations																			
	Less Than 50		Standard Error		50-99		Standard Error		100 -299		Standard Error		300 or More		Standard Error		All Ops.		Standard Error	
0	98.0	(±0.4)	93.2	(±1.3)	85.2	(±2.1)	74.1	(±3.7)	95.6	(±0.4)										
1	1.9	(±0.4)	6.4	(±1.2)	14.4	(±2.0)	25.7	(±3.7)	4.2	(±0.4)										
2 <sup>1</sup>	0.1	(±0.1)	0.4	(±0.2)	0.4	(±0.2)	0.2	(±0.2)	0.2	(±0.1)										
Total	100.0		100.0		100.0		100.0		100.0					100.0						

Of the operations that implanted heifers intended for replacement prior to weaning (4.4 percent), most (4.2 percent) only implanted heifers once prior to weaning. Few operations (0.4 percent or less) in each herd size group implanted heifers for replacement more than once.

1 No operations implanted heifers intended for replacement more than two times prior to weaning.

d. Percent of operations by number of times unweaned *calves other than heifers intended for replacement* were implanted *prior to weaning* by herd size:

Number Implants	<u>Percent Operations</u>									
	Number Cows									
	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
0	91.5	(±0.9)	78.5	(±2.0)	60.3	(±2.8)	44.8	(±4.3)	85.8	(±0.8)
1	7.4	(±0.9)	18.2	(±1.8)	34.9	(±2.6)	47.5	(±4.3)	12.3	(±0.8)
2	0.9	(±0.3)	3.3	(±0.8)	4.5	(±1.2)	7.7	(±2.1)	1.7	(±0.3)
3 or more	<u>0.2</u>	(±0.1)	<u>0.0</u>	(±0.0)	<u>0.3</u>	(±0.2)	<u>0.0</u>	(±0.0)	<u>0.2</u>	(±0.1)
Total	100.0		100.0		100.0		100.0		100.0	

Of the operations that implanted calves other than heifers for replacement (14.2 percent), most (12.3 percent) only implanted calves once. Larger operations (300 or more cows) used two implants prior to weaning more frequently (7.7 percent) than the smaller operations (fewer than 50 cows, 0.9 percent). Few operations of any size used three or more implants prior to weaning in calves not intended for replacement.

e. Percent of operations by practice of implanting heifers intended for replacement and calves not intended for replacement *prior to weaning* by herd size:

Practice	<u>Percent Operations</u>									
	Number Cows									
	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Implant other calves, but not heifers for replacement	6.5	(±0.9)	14.9	(±1.6)	25.1	(±2.3)	29.6	(±4.1)	9.9	(±0.7)
Implant other calves and heifers for replacement	2.0	(±0.4)	6.6	(±1.3)	14.6	(±2.0)	25.6	(±3.7)	4.3	(±0.4)
Implant heifers for replacement but not other calves	0.1	(±0.1)	0.2	(±0.1)	0.2	(±0.2)	0.2	(±0.2)	0.1	(±0.0)
Implant neither	<u>91.4</u>	(±0.9)	<u>78.3</u>	(±2.0)	<u>60.1</u>	(±2.8)	<u>44.6</u>	(±4.3)	<u>85.7</u>	(±0.8)
Total	100.0		100.0		100.0		100.0		100.0	

f. Percent of operations by practice of implanting heifers intended for replacement and calves not intended for replacement *at weaning* by herd size:

Practice	Percent Operations									
	Number Cows									
	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Implant other calves, but not heifers for replacement	5.4	(±0.9)	14.3	(±1.7)	22.1	(±2.4)	18.4	(±3.4)	8.6	(±0.8)
Implant other calves and heifers for replacement	0.6	(±0.2)	2.7	(±0.7)	2.5	(±0.6)	7.2	(±2.3)	1.2	(±0.2)
Implant heifers for replacement but not other calves	1.1	(±0.9)	0.8	(±0.4)	1.2	(±0.4)	0.9	(±0.6)	1.0	(±0.7)
Implant neither	<u>92.9</u>	(±1.3)	<u>82.2</u>	(±1.8)	<u>74.2</u>	(±2.4)	<u>73.5</u>	(±3.9)	<u>89.2</u>	(±1.0)
Total	100.0		100.0		100.0		100.0		100.0	

g. Percent of operations by timing of implanting by calf group and herd size:

Timing	Percent Calves Born									
	Number Cows									
	Less Than 50	Standard Error	50-99	Standard Error	100 -299	Standard Error	300 or More	Standard Error	All Ops.	Standard Error
Heifers intended for replacement:										
Only prior to weaning	1.7	(±0.4)	4.5	(±1.1)	12.9	(±2.0)	20.7	(±3.4)	3.5	(±0.4)
Only at weaning	1.4	(±0.9)	1.2	(±0.4)	1.9	(±0.5)	2.9	(±1.7)	1.4	(±0.7)
Prior to and at weaning	0.3	(±0.2)	2.3	(±0.6)	1.8	(±0.5)	5.2	(±1.8)	0.9	(±0.2)
Neither prior to nor at weaning	<u>96.6</u>	(±1.0)	<u>92.0</u>	(±1.3)	<u>83.4</u>	(±2.1)	<u>71.2</u>	(±3.9)	<u>94.2</u>	(±0.8)
Total	100.0		100.0		100.0		100.0		100.0	
Other calves:										
Only prior to weaning	5.7	(±0.8)	10.6	(±1.5)	19.4	(±2.0)	33.4	(±3.9)	8.2	(±0.6)
Only at weaning	3.2	(±0.8)	6.1	(±1.1)	4.3	(±1.0)	3.8	(±1.4)	3.8	(±0.6)
Prior to and at weaning	2.8	(±0.6)	10.9	(±1.4)	20.3	(±2.3)	21.8	(±3.7)	6.0	(±0.5)
Neither prior to nor at weaning	<u>88.3</u>	(±1.2)	<u>72.4</u>	(±2.2)	<u>56.0</u>	(±2.8)	<u>41.0</u>	(±4.3)	<u>82.0</u>	(±1.0)
Total	100.0		100.0		100.0		100.0		100.0	

## Section II: Sample Profile

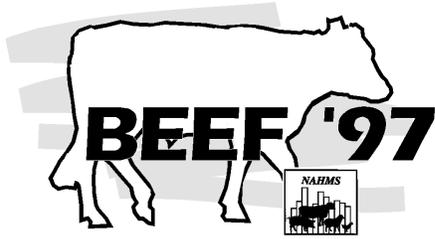
### A. Responding operations

	<u>Number Responding Operations</u>
1. Total cattle and calves on hand, January 1, 1997:	
Less than 50	664
50 - 99	638
100 - 399	1,061
400 or more	<u>350</u>
Total	2,713
2. Total beef cows on hand January 1, 1997:	
Less than 50	1,231
50 - 99	645
100 - 299	641
300 or more	<u>196</u>
Total	2,713
3. Total operations by region:	
West	460
Northcentral	443
Southcentral	628
Central	437
Southeast	<u>745</u>
Total	2,713

## Section III: U.S. Inventory of Beef Cows and Number of Operations Estimates<sup>1</sup>

<u>Region</u>	<u>State</u>	Number Beef Cows, January 1, 1997 <u>(Thousand Head)</u>	Operations with Beef Cows, 1996 <u>(Thousands)</u>
West:			
	California	820	15.0
	Colorado	826	9.5
	Montana	1,570	11.7
	New Mexico	533	6.5
	Oregon	607	16.8
	Wyoming	<u>794</u>	<u>4.9</u>
	Total	5,150	64.4
Northcentral:			
	Kansas	1,489	30.0
	Nebraska	1,932	22.0
	North Dakota	940	12.4
	South Dakota	<u>1,660</u>	<u>18.0</u>
	Total	6,021	82.4
Southcentral:			
	Oklahoma	1,965	54.0
	Texas	<u>5,460</u>	<u>133.0</u>
	Total	7,425	187.0
Central:			
	Arkansas	954	26.0
	Illinois	460	17.8
	Iowa	1,030	28.0
	Missouri	<u>2,075</u>	<u>64.0</u>
	Total	4,519	135.8
Southeast:			
	Alabama	829	32.0
	Florida	1,072	18.0
	Georgia	692	25.0
	Kentucky	1,160	45.0
	Mississippi	682	29.0
	Tennessee	1,085	54.0
	Virginia	<u>740</u>	<u>26.0</u>
	Total	6,260	229.0
<hr/>			
Total (23 states):		29,375 (85.7% of U.S.)	698.6 (77.6% of U.S.)
Total U.S. (50 states):		34,280	900.7

<sup>1</sup> Source: USDA, National Agricultural Statistics Service. Cattle. January 31, 1997.



# Expected Products and Related Study Objectives

## 1. Support global trade by estimating the prevalence of important animal pathogens.

- Johnes disease (interpretive summary), expected summer 1998.
- Bovine leukosis virus and Salmonella (info sheets), expected summer 1998.

## 2. Support efforts of the industry to supply quality products.

- Part I: Reference of 1997 Beef Cow-Calf Management Practices, June 1997.
- *Part II: Reference of 1997 Beef Cow-Calf Health & Health Management Practices*, July 1997.
- Quality assurance (info sheet), expected fall 1997.
- Calving management (info sheet), expected summer 1997.
- Injection sites (info sheet), expected fall 1997.
- Implants (info sheet), expected fall 1997

## 3. Support the efforts of APHIS to achieve a high level of emergency preparedness.

- Part I: Reference of 1997 Beef Cow-Calf Management Practices, June 1997.

## 4. Describe trends in animal health.

- Part III: Changes in Beef Cow-Calf Management Practices, expected summer 1998.

## 5. Support disease control efforts.

- Vaccinations (info sheet), expected fall 1997.
- Johnes disease (interpretive summary), expected summer 1998.
- Bovine leukosis virus and Salmonella (info sheets), expected summer 1998.
- *Part II: Reference of 1997 Beef Cow-Calf Health & Health Management Practices*, July 1997.

## 6. Support efforts of the beef industry to become more efficient.

- Part I: Reference of 1997 Beef Cow-Calf Management Practices, June 1997.
- *Part II: Reference of 1997 Beef Cow-Calf Health & Health Management Practices*, July 1997.
- Cost of production (info sheet), expected fall 1997.